Trend Study 4-15-01

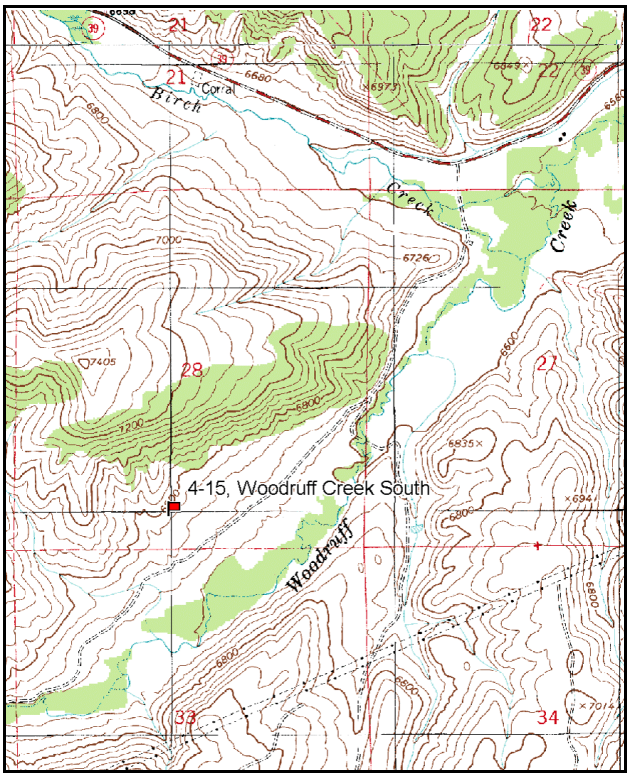
Study site name: Woodruff Creek South . Vegetation type: Big Sagebrush .

Compass bearing: frequency baseline 26 degrees magnetic.

Frequency belt placement: Line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

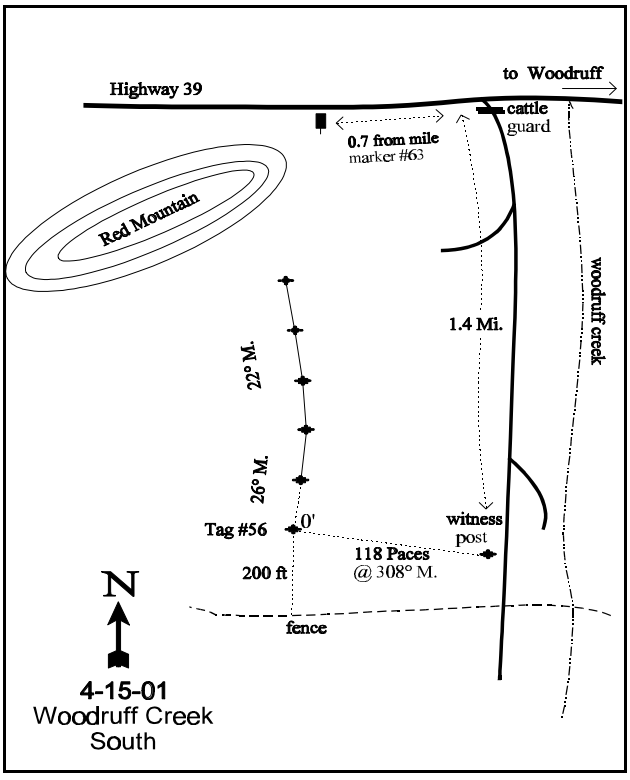
LOCATION DESCRIPTION

Travel south on highway 39 and turn right (west) 0.7 miles past mile marker #63. Travel west for 1.4 miles to a witness post on the right hand side of the road. From the witness post, walk 118 paces at 308 degrees magnetic to the 0-foot baseline stake. The 0-foot baseline stake is marked with a browse tag #56. There is a fence 200 feet to the west from the 0-foot baseline stake. The baseline runs in a direction of 26 degrees magnetic. The baseline doglegs at the 300-foot baseline stake and runs in a direction of 22 degrees magnetic.



Map Name: Meachum Ridge

Township 9N , Range 6E , Section 28



Diagrammatic Sketch

UTM 4591981 N 476988 E

DISCUSSION

Trend Study No. 4-15

The Woodruff Creek South site is a new study established in 1996. It is placed down stream from Woodruff reservoir and about one-third of a mile north of Woodruff creek. The site samples a Wyoming big sagebrush site with a juniper overstory. Slope varies from 10% to 20% with an elevation of about 6,700 feet. The area typically receives heavy winter use by deer. Five winter killed deer were found on the site in 1996. They appear to have been dead for a few years and probably died during the particularly harsh winter of 1992-93. Deer pellet groups were fairly numerous in 1996, with a quadrat frequency of 28%. Cattle had utilized the site prior to the 1996 reading and were grazing just west of the site in another pasture when the site was read. Deer pellet group quadrat frequency was also moderately high in 2001, at 34%. A pellet group transect read on the site in 2001, estimated 31 deer days use/acre (76 ddu/ha) and 34 cow days use/acre (84 cdu/ha). All deer pellet groups appeared to be from winter use while cattle pats were from the previous fall (2000).

The soil is moderately deep but gravely. Effective rooting depth is estimated at a little over 12 inches. Soil texture is a sandy clay loam with a neutral soil reaction (pH of 6.8). Infiltration is likely rapid and water holding capacity poor. Pea sized gravel covers bare areas where there is no vegetative ground cover. At about 6 inches in depth, a layer of larger gravel can be detected. The soil doesn't have much structure and was dry down to about 1½ feet in 1996. Unprotected bare ground is not abundant on the site due to the adequate herbaceous ground cover. Unfortunately most of that cover comes from cheatgrass. Some erosion is occurring in the form of flow patterns, rills, pedestalling, and an active gully near the end of the study site baseline. However, it is currently not excessive and the soil erosion condition class was determined as slight in 2001.

The site supports a moderately dense stand of Wyoming big sagebrush with an estimated density of 3,300 plants/acre in 1996, increasing to 5,480 plants/acre by 2001. Most of the sagebrush sampled in 1996 was losing its leaves due the excessively dry conditions. Data from Woodruff indicates that only 62% of the normal precipitation was collected from April-Sept of 1996 (Utah climate summaries 2001). Seed production appeared good with mostly light utilization. Seedlings were abundant with an additional 18% of the population classified as young plants. Decadent plants accounted for 33% of the population. Dead plants were also numerous, numbering 840 plants/acre (1:4 dead to live plant ratio), indicating a fairly rapid turnover on the site. Density increased to 5,480 plants/acre in 2001. Utilization was still light to moderate, vigor good, and percent decadence declined from 33% to 23%. Young plants were numerous and accounted for 29% of the population.

Other shrubs encountered include narrowleaf low rabbitbrush, prickly pear, and a few gray horsebrush. A few snowberry and winterfat plants were also observed on the site but not sampled. Juniper trees are scattered through the area. Most of the mature trees are highlined. There are quite a few young trees in the 3 to 4 foot class. Point-quarter data estimated 85 juniper trees/acre with an average diameter of 4 inches in 1996. During the 2001 reading, point-quarter data estimated 94 trees/acre with an average diameter of 7 inches. Overhead canopy cover averaged 11% during both readings.

The herbaceous understory consists of patches of thick cheatgrass. In other areas where cheatgrass is not as abundant, Sandberg bluegrass, western and bluebunch wheatgrass are common. Also fairly abundant is Indian ricegrass. Several other perennial grasses are found on the site in small numbers. Cheatgrass accounted for 63% of the total grass cover on the site in 1996, while Sandberg bluegrass and bluebunch wheatgrass combined to produce 30%. Due to the dry conditions of 2000 and 2001 (Utah climate summaries 2001), average cover of the annual, cheatgrass, declined from 16% to only about 2%. Cheatgrass now provides only 13% of the total grass cover. Forbs are almost absent, combining to produce less than one-half of 1% cover in 1996 and 2001.

1996 APPARENT TREND ASSESSMENT

The soil trend appears stable due to the gentle terrain and the sandy nature of the soil. Herbaceous cover is also abundant yet composed mostly of cheatgrass. The browse trend also appears stable. Seedlings are abundant and young sagebrush account for 18% of the population. Utilization is mostly light and vigor normal. The herbaceous understory contains several desirable perennial grasses, but only Sandberg bluegrass is very abundant. Cheatgrass currently makes up 63% of the grass cover. Forbs are nearly nonexistent. Trend appears stable, but with a poor composition (too much cheatgrass) and almost nonexistence of forbs.

2001 TREND ASSESSMENT

Trend for soil is down slightly due to a 53% increase in bare ground and a decline in herbaceous vegetation cover from 25% in 1996 to 13% in 2001. Litter cover remained similar. The decline in herbaceous cover comes entirely from a significant reduction in cheatgrass. Cover and nested frequency of perennial grasses actually increased slightly since 1996. Some erosion is occurring on the site, but it is not excessive. The erosion condition class was determined as only slight in 2001. Trend for Wyoming big sagebrush is up. Density has increased 40%, utilization continues to be light to moderate, vigor is good, and percent decadence has declined to 23%. Reproduction is also excellent with abundant seedlings and young. Annual leader growth of Wyoming big sagebrush averaged only 1.2 inches, but this is above the average for the Wyoming big sagebrush sites in Unit 4 which averaged only 1 inch of annual growth. The only other common shrub consists of stickyleaf low rabbitbrush which has remained relatively stable in density. Trend for the herbaceous understory is up slightly. Sum of nested frequency for perennial grasses has increased slightly while frequency of cheatgrass has declined significantly. Cover of cheatgrass has also declined from 16% to 2% due to the dry conditions of the past 2 years. Forbs are nearly nonexistent but have remained at similar frequencies compared to 1996.

TREND ASSESSMENT
soil - down slightly (2)
browse - up (5)
herbaceous understory - up slightly (4)

HERBACEOUS TRENDS --
Herd unit 04 , Study no: 15

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'96	'01	'96	'01	'96	'01
G	Agropyron smithii	37	*123	14	35	.29	2.29
G	Agropyron spicatum	52	*2	15	2	1.37	.01
G	Bromus tectorum (a)	354	*232	87	72	15.76	1.60
G	Elymus cinereus	4	-	2	-	.06	-
G	Koeleria cristata	2	-	1	-	.00	-
G	Oryzopsis hymenoides	36	*22	20	10	.81	.49
G	Poa fendleriana	9	-	5	-	.22	-
G	Poa pratensis	1	-	1	-	.03	-
G	Poa secunda	257	309	76	91	6.25	7.15
G	Sitanion hystrix	22	*13	11	4	.23	.04
G	Stipa comata	2	*31	2	12	.03	1.09
Total for Annual Grasses		354	232	87	72	15.76	1.60
Total for Perennial Grasses		422	500	147	154	9.30	11.10
Total for Grasses		776	732	234	226	25.07	12.71
F	Antennaria rosea	-	5	-	2	-	.01
F	Arabis drummondi	12	*-	6	-	.03	.03
F	Astragalus convallarius	2	*15	1	7	.01	.16
F	Astragalus spp.	2	-	1	-	.03	-
F	Astragalus utahensis	5	5	2	2	.03	.06
F	Chaenactis douglasii	1	3	1	1	.00	.00
F	Cryptantha spp.	-	-	-	-	.03	-
F	Descurainia pinnata (a)	6	2	3	1	.04	.00
F	Erigeron pumilus	-	1	-	1	-	.00
F	Lappula occidentalis (a)	-	7	-	3	-	.04
F	Orobanche spp.	5	-	2	-	.01	-
F	Phlox hoodii	6	6	4	3	.04	.04
F	Phlox longifolia	3	4	1	2	.00	.01
F	Tragopogon dubius	-	3	-	2	-	.01
Total for Annual Forbs		6	9	3	4	0.04	0.04
Total for Perennial Forbs		36	42	18	20	0.20	0.32
Total for Forbs		42	51	21	24	0.24	0.37

* Indicates significant difference at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 04 , Study no: 15

Type	Species	Strip Frequency '96	Strip Frequency '01	Average Cover % '96	Average Cover % '01
B	Artemisia tridentata wyomingensis	83	86	10.83	10.98
B	Atriplex canescens	0	0	-	.03
B	Chrysothamnus viscidiflorus viscidiflorus	58	54	2.68	1.89
B	Juniperus osteosperma	7	8	6.98	8.26
B	Opuntia spp.	13	6	.16	.00
B	Tetradymia canescens	3	3	.01	-
Total for Browse		164	157	20.67	21.20

CANOPY COVER --
Herd unit 04 , Study no: 15

Species	Percent Cover '96	Percent Cover '01
Juniperus osteosperma	7	11

Point-Quarter Tree Data

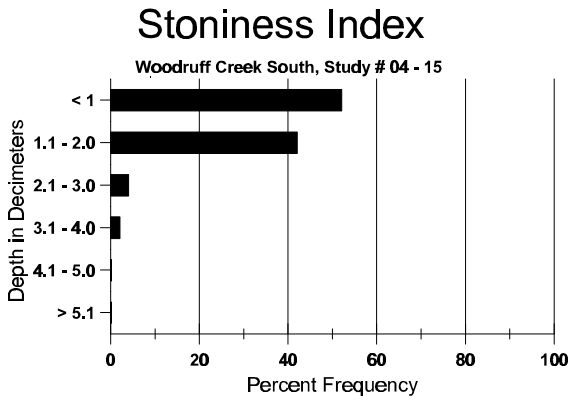
Trees per Acre '96	Trees per Acre '01	Average diameter (in) '96	Average diameter (in) '01
85	93	4.1	7.4

BASIC COVER --
Herd unit 04 , Study no: 15

Cover Type	Nested Frequency '96	Nested Frequency '01	Average Cover % '96	Average Cover % '01
Vegetation	444	403	44.31	37.37
Rock	187	131	3.07	1.93
Pavement	266	312	10.89	13.43
Litter	494	472	46.23	47.56
Cryptogams	89	121	2.21	4.95
Bare Ground	219	257	7.96	14.96

SOIL ANALYSIS DATA --
Herd Unit 04, Study no: 15, Woodruff Creek South

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
12.3	61.0 (12.4)	6.8	53.7	19.3	27.0	2.8	20.9	204.8	.7



PELLET GROUP FREQUENCY --
Herd unit 04 , Study no: 15

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'96	'01	'01	'01
Rabbit	13	25	61	N/A
Horse	1	-	17	N/A
Elk	7	1	-	-
Deer	28	34	400	31 (76)
Cattle	6	12	409	34 (84)

BROWSE CHARACTERISTICS --
Herd unit 04 , Study no: 15

AGE	YR	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Artemisia tridentata wyomingensis																		
S	96	55	-	-	-	-	-	-	-	-	55	-	-	-	1100			55
	01	18	-	-	-	-	-	-	-	-	18	-	-	-	360			18
Y	96	29	1	-	-	-	-	-	-	-	30	-	-	-	600			30
	01	79	-	-	-	-	-	-	-	-	79	-	-	-	1580			79
M	96	65	15	-	-	-	-	-	-	-	80	-	-	-	1600	18	36	80
	01	96	34	1	-	-	-	2	-	-	133	-	-	-	2660	17	28	133
D	96	38	15	1	1	-	-	-	-	-	46	-	-	9	1100			55
	01	36	23	1	2	-	-	-	-	-	61	-	-	1	1240			62
X	96	-	-	-	-	-	-	-	-	-	-	-	-	-	840			42
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	720			36

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'96	19%	.60%	05%	+40%
'01	21%	.72%	.36%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'96	3300	Dec:	33%
	'01	5480		23%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Atriplex canescens																		
M	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	14	27	0
% Plants Showing			Moderate Use			Heavy Use			Poor Vigor						%Change			
	'96		00%			00%			00%									
	'01		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)													'96		0	Dec:		-
													'01		0			-
Chrysothamnus viscidiflorus viscidiflorus																		
S	96	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	96	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
	01	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	96	111	-	-	-	-	-	-	-	-	111	-	-	-	2220	13	20	111
	01	88	-	-	12	-	-	1	-	-	101	-	-	-	2020	10	15	101
D	96	7	-	-	-	-	-	-	-	-	5	-	-	2	140			7
	01	13	-	-	-	-	-	-	-	-	9	1	-	3	260			13
X	96	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing			Moderate Use			Heavy Use			Poor Vigor						%Change			
	'96		00%			00%			02%						- 8%			
	'01		00%			00%			03%									
Total Plants/Acre (excluding Dead & Seedlings)													'96		2540	Dec:		6%
													'01		2340			11%
Gutierrezia sarothrae																		
M	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	5	8	0
% Plants Showing			Moderate Use			Heavy Use			Poor Vigor						%Change			
	'96		00%			00%			00%									
	'01		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)													'96		0	Dec:		-
													'01		0			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
Y	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	96	7	-	-	-	-	-	-	-	-	7	-	-	-	140	-	-	7
	01	6	-	-	-	-	-	-	2	-	7	1	-	-	160	-	-	8
% Plants Showing			Moderate Use			Heavy Use			Poor Vigor						%Change			
	'96		00%			00%			00%						+22%			
	'01		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)													'96		140	Dec:		-
													'01		180			-
Opuntia spp.																		
Y	96	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
	01	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
M	96	14	-	-	-	-	-	-	-	-	14	-	-	-	280	4	15	14
	01	5	-	-	-	-	-	-	-	-	5	-	-	-	100	3	10	5
D	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	01	3	-	-	-	-	-	-	-	-	-	-	-	3	60			3
X	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing			Moderate Use			Heavy Use			Poor Vigor						%Change			
	'96		00%			00%			00%						-29%			
	'01		00%			00%			20%									
Total Plants/Acre (excluding Dead & Seedlings)													'96		420	Dec:		5%
													'01		300			20%
Tetradymia canescens																		
M	96	4	-	-	-	-	-	-	-	-	4	-	-	-	80	12	23	4
	01	4	-	-	-	-	-	-	-	-	4	-	-	-	80	8	20	4
% Plants Showing			Moderate Use			Heavy Use			Poor Vigor						%Change			
	'96		00%			00%			00%						+ 0%			
	'01		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)													'96		80	Dec:		-
													'01		80			-